

# Materials Engineering Curriculum - Fall 2022

Non-CEGEP Entry

1st Term (Fall)		15 credits	Prerequisites/Co-requisites
CHEM 110	General Chemistry 1	4	P - College level mathematics and physics or permission of instructor
FACC 100	Introduction to the Engineering Profession	1	-
MATH 133	Linear Algebra and Geometry	3	P - A course in functions
MATH 140	Calculus 1	3	P - High school calculus
PHYS 131	Mechanics and Waves	4	C - Calculus course [MATH 140]
2nd Term (Winter)		15 credits	Prerequisites/Co-requisites
CHEM 120	General Chemistry 2	4	P - College level mathematics and physics or permission of instructor
MATH 141	Calculus 2	4	P - MATH 140
PHYS 142	Electromagnetism and Optics	4	P - PHYS 131 / C - MATH 141
CS	Complementary Studies Group B (HSSML) - 1*	3	-
3rd Term (Fall)		15 credits	Prerequisites/Co-requisites
WCOM 206	Communication in Engineering	3	-
MATH 262	Intermediate Calculus	3	P - MATH 133, MATH 141
MECH 289	Design Graphics	3	-
MIME 250	Introduction to Extractive Metallurgy	3	C - WCOM 206
MIME 261	Structure of Materials	3	-
4th Term (Winter)		15 credits	Prerequisites/Co-requisites
CHEM 233	Topics in Physical Chemistry	3	-
CIVE 205	Statics	3	-
MIME 209	Mathematical Applications	3	-
MIME 212	Engineering Thermodynamics	3	-
MIME 341	Introduction to Mineral Processing	3	P - MIME 200 or MIME 250
5th Term (Summer)		3 credits	Prerequisites/Co-requisites
MATH 263	Ordinary Differential Equations for Engineers	3	C - MATH 262
6th Term (Fall)		17 credits	Prerequisites/Co-requisites
CIVE 207	Solid Mechanics	4	P - CIVE 205 or MECH 210
COMP 208	Computers in Engineering	3	P - differential and integral calculus [MATH 140 and MATH 141] / C - linear algebra [MATH 133]
FACC 250	Responsibilities of the Professional Engineer	0	P - FACC 100 or BREE 250
MIME 317	Analytical and Characterization Techniques	3	P - MIME 261
MIME 356	Heat, Mass and Fluid Flow	4	P - MIME 212
MIME 360	Phase Transformations: Solids	3	P - MIME 260 or MIME 261 / P or C - MIME 212
7th Term (Winter)		2 credits	Prerequisites/Co-requisites
MIME 280	Industrial Training 1	2	P - 40 program credits
8th Term (Summer)		12 credits	Prerequisites/Co-requisites
FACC 300	Engineering Economy	3	-
MIME 345	Applications of Polymers	3	P - MIME 261 or instructor permission
MIME 350	Extractive Metallurgical Engineering	3	P - MIME 200 or MIME 250, MIME 212
MIME 467	Electronic Properties of Materials	3	P - MIME 261, MATH 263
9th Term (Fall)		18 credits	Prerequisites/Co-requisites
ECSE 209	Electrotechnology	3	P - PHYS 142
MIME 352	Hydrochemical Processing	3	P - CHEM 233, MIME 200 or MIME 250, MIME 212, MIME 356
MIME 362	Mechanical Properties	3	P - MIME 360
MIME 465	Metallic and Ceramic Powders Processing	3	P - MIME 360
MIME 470	Engineering Biomaterials	3	P - MIME 261
MIME xxx	Technical Complementary	3	-
10th Term (Winter)		15 credits	Prerequisites/Co-requisites
MATH 264	Advanced Calculus for Engineers	3	P - MATH 262 / C - MATH 263
MIME 311	Modelling and Automatic Control	3	P - MIME 356
MIME 455	Advanced Process Engineering	3	P - MIME 356
MIME xxx	Technical Complementary	3	-
CS	Complementary Studies Group A (Impact)*	3	-
11th Term (Summer)		2 credits	Prerequisites/Co-requisites
MIME 380	Industrial Training 2	2	P - MIME 280
12th Term (Fall)		2 credits	Prerequisites/Co-requisites
MIME 480	Industrial Training 3	2	P - MIME 380
13th Term (Winter)		17 credits	Prerequisites/Co-requisites
FACC 400	Engineering Professional Practice	1	P - FACC 100, FACC 250**, and 60 program credits
MIME 452	Process and Materials Design	4	-
MIME 456	Steelmaking and Steel Processing	3	P - MIME 360 / P or C - MIME 455
MIME 473	Introduction to Computational Materials Design	3	P - MIME 209 and MIME 261, or permission of instructor
MIME xxx	Technical Complementary	3	-
CS	Complementary Studies Group B (HSSML) - 2*	3	-

Technical Complementary courses are selected from an approved list given on the next page.

\*The Complementary Studies (CS) courses are Impact of Technology courses (Group A) and Humanities & Social Sciences, Management Studies and Law courses (Group B). Students must take one course (3 credits) from Group A and two courses (6 credits) from Group B. The curriculum above includes suggested terms during which these courses can be taken. These must be chosen from an approved list of courses/departments, found in the program list under "Complementary Studies" in the Faculty of Engineering Undergraduate section of the Programs, Courses and University Regulations publication ([www.mcgill.ca/study](http://www.mcgill.ca/study)) (see your program listing in the "Browse Academic Units & Programs" section).

\*\*FACC 250 is not yet indicated as a prerequisite in the eCalendar course information ([www.mcgill.ca/study](http://www.mcgill.ca/study)) but it will be before FACC 400 is taken. Students are responsible for satisfying pre-/co-requisites and verifying with their department that they are meeting the requirements of their program.

## Technical Complementary Courses - Materials Engineering

6 - 9 credits from the following:

		Credits	Prerequisites/Co-requisites
CIVE 512	Advanced Civil Engineering Materials	3	P - CIVE 202
MECH 530	Mechanics of Composite Materials	3	P - MECH 321
MIME 410	Research Project	3	P - Recommendation of instructor
MIME 442	Analysis, Modelling and Optimization in Mineral Processing	3	P - MIME 341
MIME 512	Corrosion and Degradation of Materials	3	P - MIME 261 and MIME 352 or permission of instructor
MIME 515	Material Surfaces: A Biomimetic Approach	3	P - (CHEE 310, CHEE 380) or (CHEM 233, MIME 261, MIME 317) or permission of instructor
or CHEE 515	Material Surfaces: A Biomimetic Approach	3	permission of instructor
MIME 526	Mineral Economics	3	P - Permission of instructor; background in economics required
MIME 542	Transmission Electron Microscopy	3	P - Permission of instructor
MIME 544	Analysis: Mineral Processing Systems 1	3	P - MIME 341
MIME 545	Analysis: Mineral Processing Systems 2	3	P - MIME 341
MIME 551	Electrochemical Processing	3	P - MIME 352
MIME 556	Sustainable Materials Processing	3	P - Permission of instructor
MIME 558	Engineering Nanomaterials	3	P - (MIME 260 or MIME 261) and MIME 362 or equivalent, or instructor permission
MIME 559	Aluminum Physical Metallurgy	3	P - MIME 360 and MIME 362 or instructor permission
MIME 560	Joining Processes	3	P - MIME 250, MIME 360
MIME 561	Advanced Materials Design	3	P - MIME 362 or equivalent
MIME 563	Hot Deformation of Metals	3	P - MIME 360, MIME 362
MIME 565	Aerospace Metallic-Materials and Manufacturing Processes	3	P - MIME 260 or MIME 261 or instructor permission
MIME 568	Topics in Advanced Materials	3	P - MIME 362 or equivalent
MIME 569	Electron Beam Analysis of Materials	3	P - MIME 317
MIME 570	Micro- and Nano-Fabrication Fundamentals	3	P - MIME 467 or ECSE 330 or equivalent, or permission of instructor
MIME 571	Surface Engineering	3	P - MIME 362
MIME 572	Computational Thermodynamics	3	P - MIME 212 or equivalent
MIME 580	Additive Manufacturing Using Metallic and Ceramic Materials	3	P - MIME 465 or instructor permission

0 - 3 credits from courses outside of the Department of Mining and Materials Engineering, with departmental approval.

**Last update: April 14, 2022**

For the official program listing, see the *Programs, Courses and University Regulations* publication ([www.mcgill.ca/study](http://www.mcgill.ca/study)).